



266150

**Five-Year Review Report**  
**First Five-Year Review Report**  
**for**  
**Yeoman Creek Landfill Site**

**Waukegan**

**Lake County, IL**

**February, 2007**

**PREPARED BY:**

**United States Environmental Protection Agency**  
**Region 5**  
**Chicago, Illinois**

Approved by:

for Richard M. Karl, Director  
Superfund Division

Date:

3/29/07

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# Five-Year Review Report

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## **List of Acronyms**

ARARs Applicable or Relevant and Appropriate Requirements

CALs Cleanup Action Levels

CERCLA Comprehensive Environmental Response Compensation and Liability Act of 1980

CD Consent Decree

IEPA Illinois Environmental Protection Agency

ICs Institutional controls

LEL Lower Explosive Limit

LFG Landfill Gas

MCL Maximum Contaminant Level

NCP National Oil and Hazardous Substance Contingency Plan

NPL National Priorities List

O&M Operation and Maintenance

OMC Outboard Marine Corporation

PCBs Polychlorinated Biphenyls

PRPs Potentially Responsible Parties

RA Remedial Action

RAO Remedial Action Objective

RD Remedial Design

ROD Record of Decision

RPM Remedial Project Manager

SARA Superfund Amendments and Reauthorization Act of 1986

U.S. EPA U.S. Environmental Protection Agency

VOCs Volatile Organic Compounds

UU/UE Unlimited Use or Unrestricted Exposure

YCL Yeoman Creek Landfill Site

YCRG Yeoman Creek Remediation Group

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## **Executive Summary**

The Yeoman Creek Landfill Site ("YCL") is located in Waukegan, Lake County, Illinois. The YCL, which occupies approximately 70 acres of land, was placed on the National Priorities List ("NPL") for site cleanup on March 31, 1989.

The YCL was operated as a landfill between 1958 and 1969, reportedly accepting both municipal and industrial wastes. The YCL was largely constructed within wetlands and also within the flood plain of Yeoman Creek. Leachate was observed discharging to Yeoman Creek as early as 1969.

Interim and removal actions including fencing, improving the soil cover, a building ventilation system and a gas collection system were implemented to address imminent and substantial threats. Long term response actions have been implemented at the site as required by the Record of Decision ("ROD"), as modified. The long term response actions included removal of contaminated sediment from Yeoman Creek and nearby wetlands; consolidation of wastes under a flexible dual barrier cover; continuation of measures to address landfill gas ("LFG"); long-term monitoring; and institutional controls.

The remedy at the YCL is not protective because the LFG collection system is not operating as designed; i.e., LFG above 50% of the lower explosive limit ("LEL") continues to migrate beyond the landfill boundary. Additional remedial action as well as implementation and compliance with land use restrictions that prohibit interference with the dual barrier cover and the LFG collection system and prohibit groundwater use are necessary to ensure protectiveness. U.S. EPA and the responsible parties are negotiating the details of the additional remedial action that is expected to include a separate gas collection system for the northern portion of the site.



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## Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name (from WasteLAN): Yeoman Creek Landfill		
EPA ID (from WasteLAN): ILD980500102		
Region: 5	State: IL	City/County: Waukegan/Lake County
SITE STATUS		
NPL status: <input checked="" type="checkbox"/> Final <input type="checkbox"/> Deleted <input type="checkbox"/> Other (specify)		
Remediation status (choose all that apply): <input type="checkbox"/> Under Construction <input checked="" type="checkbox"/> Operating <input type="checkbox"/> Complete		
Multiple OUs?* <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Construction completion date: 09/23/2005 (PCOR)	
Has site been put into reuse? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
REVIEW STATUS		
Lead agency: <input checked="" type="checkbox"/> EPA <input type="checkbox"/> State <input type="checkbox"/> Tribe <input type="checkbox"/> Other Federal Agency _____		
Author name: MATTHEW J. OHL		
Author title: Remedial Project Manager	Author affiliation: EPA	
Review period:** 10/01/2007 to 02/28/2007		
Date(s) of site inspection: 01/03/2007		
Type of review: <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span><input checked="" type="checkbox"/> Post-SARA</span> <span><input type="checkbox"/> Pre-SARA</span> <span><input type="checkbox"/> NPL-Removal only</span> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span><input type="checkbox"/> Non-NPL Remedial Action Site</span> <span><input type="checkbox"/> NPL State/Tribe-lead</span> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span><input type="checkbox"/> Regional Discretion</span> </div>		
Review number: <input checked="" type="checkbox"/> 1 (first) <input type="checkbox"/> 2 (second) <input type="checkbox"/> 3 (third) <input type="checkbox"/> Other (specify) _____		
Triggering action: <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span><input checked="" type="checkbox"/> Actual RA Onsite Construction at OU # 00</span> <span><input type="checkbox"/> Actual RA Start at OU#_____</span> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span><input type="checkbox"/> Construction Completion</span> <span><input type="checkbox"/> Previous Five-Year Review Report</span> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span><input type="checkbox"/> Other (specify)</span> </div>		
Triggering action date (from WasteLAN): 02/28/2002		
Due date (five years after triggering action date): 02/28/2007		

\* ["OU" refers to operable unit.]

\*\* [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

## Five-Year Review Summary Form, cont'd.

### Issues:

1. Gas Collection System Failure
2. Institutional controls are needed for properties impacted by the site and a plan to assure long-term stewardship
3. Perimeter fence and signs need maintenance and /or repair
4. Grading and reseeding is needed in several areas of the site cover
5. Monitoring wells, gas probes, and ventilators need repair and maintenance

### Recommendations and Follow-up Actions:

1. Further remedial action is necessary including a separate gas collection system
  - 2a. IC Plan including provision for implementation of easements /restrictive covenants for all affected properties (including titlework and mapping) by the Yeoman Creek Remediation Group ("YCRG").
  - 2b. Update O&M Plan to ensure long-term stewardship which includes maintaining and monitoring effective ICs.
3. Repair the signs and openings in the fence and gate. Remove vegetative growth from fence.
4. Correct ponding, erosion, sparse vegetative cover and animal burrow problems.
5. Inspect the groundwater monitoring wells, probes and casings for integrity and repair as necessary. Label casings so they are easily identified from the landfill surface. Secure all wells and probes with locks.

### Protectiveness Statement(s):

The remedy at the YCL is not protective because the landfill gas ("LFG") collection system is not operating as designed; i.e., LFG above 50% of the LEL continues to migrate beyond the landfill boundary. Additional remedial action as well as implementation and compliance with land and groundwater use restrictions that prohibit interference with the dual barrier cover and LFG system and prohibit use of groundwater are necessary to ensure protectiveness. U.S. EPA and the responsible parties are negotiating the details of the additional remedial action that is expected to include a separate gas collection system for the northern portion of the site.

### Other Comments:

None.

# **Five-Year Review Report**

## **I. Introduction**

The purpose of the five-year review is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review reports. In addition, Five-Year Review reports identify issues found during the review, if any, and identify recommendations to address them.

The U.S. Environmental Protection Agency (“U.S. EPA”) is preparing this Five-Year Review report pursuant to Section 121 of the Comprehensive Environmental Response Compensation and Liability Act of 1980 (“CERCLA”), as amended by the Superfund Amendments and Reauthorization Act of 1986 (“SARA”), and Section 300.430(f)(4)(ii) of the National Oil and Hazardous Substance Contingency Plan (“NCP”). CERCLA Section 121 states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section 104 or 106, the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

The Agency interpreted this requirement further in the NCP. The NCP at 40 CFR 300.430(f)(4)(ii) states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

U.S. EPA, Region 5, conducted the five-year review of the remedy implemented at the Yeoman Creek Landfill site (“YCL”) in Waukegan, Lake County, Illinois. This report documents the results of this review conducted by Matthew J. Ohl, Remedial Project Manager (“RPM”) for the site. The review was initiated in October 2006 and completed in February 2007. The Illinois Environmental Protection Agency (“IEPA”) also reviewed this report. This is the first five-year review for the YCL. The triggering action for this statutory review is the start of actual on-site remedial action construction on February 28, 2002. The five-year review is required because hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure.

## II. Site Chronology

**Table 1: Chronology of Site Events**

Event	Date
Initial discovery of problem or contamination	1969
NPL listing	March 31, 1989
Interim and removal actions including installing a fence around the site, construction of a building ventilation system, and construction of a landfill gas collection system	1990- 1998
Remedial Investigation/Feasibility Study complete	1995
ROD signature	September 30, 1996
UAO Issued to PRPs	April 28, 1998
Consent Decree for RD/RA	April 7, 1999
Pre-Design Investigation	1999 - 2000
Remedial Design Approved	July 2001
Remedial Action Completed	September 2005
PCOR	September 2005
Memo documenting minor changes to the remedy	February 2002
On-site Remedial Action Construction Start	February 28, 2002

## III. Background

### Physical Characteristics

The YCL is located between Sunset Avenue (W. Golf Road) on the north, Glen Flora Avenue on the south, Lewis Avenue on the west, and Butrick/Western Avenue on the east in the City of Waukegan, Illinois. Its geographical coordinates are latitude 42° 23' 20" N, longitude 87° 50' 55" W. The YCL is an approximately 70-acre area consisting of three units (see attached Figure 1). The units include Yeoman Creek Landfill located to the north of the Commonwealth Edison ("ComEd") right-of-way (marked by a series of high voltage transmission towers); the Edwards Field Landfill, formerly a baseball park; and the Rubloff Landfill. Both the Edwards Field Landfill and the Rubloff Landfill are located south of the ComEd right-of-way and east of the Waukegan Shopping Plaza and the Bank of Waukegan.

The YCL is adjacent to a large wetland, and residential and commercial developments, including single-family residences, apartment buildings, a nursing home, offices, a shopping center, and restaurants. According to the U.S. Census Bureau, approximately 26,890 people, 23.2 percent of them Black or African-American and 34.9 percent of them Hispanic, live within a 1-mile radius

of the site. Waukegan, Illinois is an environmental justice community. Homes in the area are 52.7 percent owner-occupied. The median household income of the area is \$28,427.

### **Land and Resource Use**

The current land use for the surrounding area is residential, commercial, and recreational. Nearby residents use municipal water for their water supply.

### **History of Contamination**

The YCL was operated as a landfill between 1958 and 1969, reportedly accepting both municipal and industrial wastes. The YCL was largely constructed within wetlands and also within the flood plain of Yeoman Creek. Its depth is thought to be fairly shallow with a maximum depth of waste burial of 19 feet. The total volume of waste landfilled at the YCL is estimated to be in excess of one million cubic yards. The site has no bottom liner, and the underlying soils are permeable. More than 67,000 people in Waukegan are supplied with drinking water from a Lake Michigan intake, which is located approximately three miles downstream from the site. About 14 active residential wells are located approximately 12 miles downgradient from the site.

Yeoman Creek flows in a southerly direction through the YCL into the Waukegan River 1.75 miles downstream. From that point, the Waukegan River flows another 2.25 miles to Lake Michigan. Leachate from the YCL has been observed seeping into Yeoman Creek since 1969, although the quantity decreased substantially after the site's soil cover was upgraded in 1980.

Contaminants of concern include volatile organic compounds ("VOCs"), polychlorinated biphenyls ("PCBs"), bis(2-ethylhexyl)phthalate, and elevated concentrations of lead, manganese, iron, chloride, and ammonia in leachate. Some groundwater samples contained low concentrations of VOCs, bis(2-ethylhexyl)phthalate, and elevated concentrations of lead, chloride, and ammonia. Sediments of Yeoman Creek at and downstream of the landfill, contain PCBs and other organic chemicals. Landfill gas ("LFG") was detected migrating beyond the YCL boundary. Combustible gases containing a number of VOCs were detected entering a building near the site. Preliminary results of the risk assessment indicate that future residential usage of the groundwater near the site would present an unacceptable health risk, as would future development of the site. There may also be significant adverse effects on wildlife in the adjacent wetland. VOC-contaminated gases present a health risk to residents of the building where they were detected, and the gases could cause fire or explosions.

### **Initial Response**

In 1980, the city added additional soil to the site cover in most areas of the landfill under an agreement with IEPA. The additional soil was intended to reduce leachate production and subsequent discharges. On March 31, 1989, the YCL was listed on the National Priorities List. In 1990, the potentially responsible parties ("PRPs") installed a fence around the site, under an agreement with U.S.EPA to limit access and improve site security. In mid-1994, the PRPs installed a ventilation system in a building adjacent to the site, under an agreement with U.S.EPA

to mitigate exposure to LFG entering the building. The ventilation system was designed to maintain positive pressure within the building. The performance of the ventilation system was monitored and its inadequacy was demonstrated leading to a removal action in 1998. The PRPs, under U.S.EPA oversight, conducted a Remedial Investigation involving ecological assessment and groundwater, leachate, and stream sampling to determine the nature and extent of the contamination at the site in 1995, culminating in a Record of Decision (“ROD”) in 1996.

### **Basis for Taking Action**

Potential exposures to soil, LFG and groundwater are associated with human health risks. The health risks are due to levels of hazardous substances exceeding U.S. EPA’s risk management criteria for either the average or reasonable maximum exposure scenarios. Risks from soil are associated with direct contact, dermal absorption and incidental ingestion of the soils. Risks from LFG are due to inhalation of the gas that carries hazardous substances as well as the potential for fire and explosion. Risks from exposure to groundwater are related to it containing various organic and inorganic hazardous substances that exist at concentrations exceeding State and federal drinking water standards and surface water quality standards.

## **IV. Remedial Actions**

### **Remedy Selection**

The Regional Administrator of USEPA, Region 5 signed a ROD for the YCL on September 30, 1996, selecting the following remedy:

- 1) Removal of contaminated sediment from Yeoman Creek and nearby wetlands to meet site specific cleanup action levels (“CALs”);
- 2) Consolidation of wastes under a flexible dual barrier cover;
- 3) Continuation of measures to address LFG;
- 4) Natural attenuation of contaminants in groundwater to meet state and federal drinking water standards;
- 4) Long-term monitoring; and
- 5) Institutional controls (“ICs”).

The ROD also required significant additional investigation of sediments, soils, and groundwater to determine the extent of contamination. These investigations were completed during 1999 and 2000. The final remedy selected in the ROD is a source control remedy, which contains or controls the landfill waste materials, contaminated soils and sediments in the landfill, and releases of leachate and LFG from the landfill. The remedy addresses all media and migration pathways that are considered to present an unacceptable risk, including landfilled wastes,

contaminated soil and sediment, and releases to surface water, to ambient air, to air within adjacent buildings, to ground water, to surface sediments, and to wetlands. This remedy does not include treatment that reduces toxicity, mobility, or volume as a principal element. The ROD may be reviewed for a more complete understanding of performance standards this remedial action is expected to achieve at <http://www.epa.gov/superfund/sites/rods/fulltext/r0596308.pdf>.

As stated in the ROD, the Remedial Action Objectives include addressing the following risks:

- human health risks in case of future development of the YCL;
- human health risks due to off-site LFG migration;
- human health and ecological risks due to the continuing releases of hazardous substances to wetlands, Yeoman Creek, and the ground water (this includes meeting drinking water standards in the aquifers at the YCL);
- human health risks from off-site soil contamination; and
- ecological risks due to contamination of sediments and limited wetland areas.

On April 28, 1998, a Unilateral Administrative Order was issued to the PRPs requiring a time critical removal action including the installation of an interim LFG collection system to remove LFG that had migrated to the basements and adjacent soils of certain buildings north of the site exceeding 25% and 50%, respectively, of the lower explosive limit ("LEL"). LFG at the site is known to contain VOCs in addition to methane gas. The LFG collection system was installed, modified several times and was able to achieve compliance in the basements of nearby occupied buildings. The system was removed during the construction of the final remedy, and off-site LFG migration is intended to be addressed by removing the gas through the final cover's ventilation layer and additional collection trenches outside the final cover.

A Consent Decree (CD) for Remedial Design (RD) and Remedial Action (RA) was entered by the court on April 7, 1999. The major settling work defendants (a.k.a. Yeoman Creek Remediation Group or "YCRG") in the CD include the following parties:

Browning Ferris Industries of Illinois, Inc.;

City of Waukegan, Illinois;

Outboard Marine Corporation;

Waukegan Community School District No. 60;

The Goodyear Tire & Rubber Company; and

The Dexter Corporation.



Outboard Marine Corporation (“OMC”) filed for bankruptcy protection under Chapter 13 in December 2000, leaving a letter of credit to fund a portion of their share of the work. Proceeds from the letter of credit were tracked down by U.S. EPA’s Office of Regional Counsel and placed into an escrow account as partial financial assurance for the remedy. The escrow account known as the OMC Trust account was established to hold and disburse the financial assurance funds provided on behalf of OMC. U.S. EPA established the minimum OMC Trust account financial assurance obligation as corresponding to YCRG’s 1999 allocation agreement: 22.975 percent of the most recently revised total financial assurance required. U.S. EPA has agreed to disbursements from the OMC Trust account for all amounts exceeding OMC’s 22.975 percent share of the total financial assurance obligation.

The Final (100%) Remedial Design was approved with conditions in July 2001.

In February 2002, U.S. EPA documented the following three minor remedy changes in a memo to the file. These changes were implemented during the remedial action included the following:

1. The ROD and the 1999 Consent Decree for Remedial Design/Remedial Action (Decree) for the Yeoman Creek Landfill required the remedy to meet the following Applicable or Relevant and Appropriate Requirements (“ARARs”) during implementation of final remedial activities for LFG control: Clean Air Act Sections 101 and 40 CAR 52; 40 CAR 61; 35 IAC811.311, 35 IAC.312; and 35 IAC 211, 212, 214, 215, 216, and 217. The remedy selected in the ROD included an active gas collection system for both the Yeoman Creek and Edward’s Field portions of the site. Based upon current data, YCRG has shown that due to the age of Edward’s Field and Rubloff Landfills, an active system is not necessary to evacuate the gas generated by these landfills at the YCL. YCRG further provided calculations to demonstrate that passive venting would control any LFG produced by the landfills. U.S. EPA allowed the wind-assisted ventilator system proposed in the Final Design to be constructed by YCRG at the Edwards Field Landfill and the adjacent Rubloff Landfill. The system is designed to be easily converted to an active system with minimal additional construction activities. Monitoring of the system will begin in spring 2007 to demonstrate that it meets all of the performance standards and other requirements listed in the above-referenced Consent Decree and the ROD to the satisfaction of U.S. EPA. In the event the system fails to meet any of the performance standards at any time, the YCRG will submit to U.S. EPA within thirty (30) days an addendum to the Remedial Action Work Plan providing for the conversion of the system to an active gas collection system.
2. The ROD required that the final cover minimize infiltration of precipitation through the landfill, consisting of the following components: a 3-foot frost protection layer including a top vegetated layer; a geosynthetic drainage layer overlain by a protective geonet providing a hydraulic conductivity of 28 cm/sec; a barrier layer consisting of a 3-foot Compacted Clay Liner which meets Illinois Solid Waste Landfill closure standards, or an equivalent primary barrier layer such as a primary barrier layer consisting of a 40 mil very low density polyethylene liner (or equivalent); a secondary barrier layer consisting of a Geosynthetic Clay Liner or a Compacted Clay Liner which meets Illinois Solid Waste Landfill closure

regulations; a gas ventilation layer; and a grading layer to provide a minimum 2% slope after settlement. The Decree clarified that YCRG may propose alternative materials provided they achieve equivalent performance. YCRG has used tire chips in lieu of gravel for the ventilation and drainage layers. U.S. EPA allowed the alternative materials to be used and is monitoring the performance of the materials to ensure that all performance standards are met.

3. The ROD also required enclosing a portion of Yeoman Creek in a steel pipe during construction. YCRG used alternatives to the steel pipe including earthen berms that provided for the protection of the creek during excavation of contaminated sediments and construction activities. U.S. EPA allowed YCRG to use these alternatives as detailed in the Final Design and the approved Remedial Action Work Plan, to the extent they provided an adequate level of protection and reliability.

### **Remedy Implementation**

YCRG initiated site work in March 2002 after selecting their remediation contractor, T.J. Lambrecht.

To minimize the cost of importing fill materials, the YCRG's design required significant excavation and regrading of waste. In late 2002, the discovery of hundreds of drums caused the contractor to halt intrusive activities due to health and safety concerns. YCRG considered replacing the contractor or using additional contractors familiar with waste handling. The YCRG's contractor removed, over-packed and properly disposed of the exposed drums off-site.

At the request of YCRG and the U.S. Army Corps of Engineers, major activities at the YCL were halted in May 2003 via a stop work order to allow time to negotiate the possible placement of dredged material from Waukegan Harbor to enhance the remedy. YCRG and the U.S. Army Corps of Engineers entered into negotiations facilitated by U.S. EPA. After long negotiations, the City of Waukegan confirmed in early April 2004 that they would never allow the placement of dredged material at the YCL in spite of its many related benefits. YCRG promptly signed contracts with Heritage Industrial Services on April 16, 2004, providing for construction of the final remedy at the YCL without the harbor sediment.

Major construction activities were completed in late 2005 and documented in a Preliminary Closeout Report dated September 2005. In July and August 2006, various repairs and improvements were made at the site including the following: the northern drainage system; condensate trap CT-14; vertical gas collection wells; and headers connecting the vertical gas collection wells to CT-11 and CT-12. Most aboveground LFG collection lines were removed.

## **Institutional Controls**

ICs are non-engineered instruments, such as administrative and/or legal controls, that help minimize the potential for exposure to contamination and protect the integrity of the remedy. Compliance with ICs is required to assure long-term protectiveness for those areas that do not allow for unlimited use or unrestricted exposure ("UU/UE"). The table below identifies the areas that do not support UU/UE and the land use restrictions associated with these areas.

**Table 2: Institutional Controls Summary**

<i>Media, engineered controls &amp; areas that do not support UU/UE based on current conditions</i>	<i>Land Use Restriction associated with engineered controls and other UU/UE areas</i>
Dual Barrier Cover and LFG Collection System at the landfills (see figure 1)	Prohibit activities that may disturb the integrity of the engineered components
Groundwater – current areas beneath the landfills that exceed groundwater cleanup standards (see figure 1)	Prohibit groundwater use until cleanup standards are achieved

Maps which depict the current conditions of the site and areas which do not allow for UU/UE will be developed in 2007 as part of the implementation of institutional controls.

Implementation of institutional controls has been postponed while the City of Waukegan pursued reuse of the site consistent with the remedial action. There has been some disagreement between the City of Waukegan and some other YCRG members regarding reuse and potential liability. There were also concerns that placing restrictions on the property prematurely would discourage reuse of the site.

**Planned Institutional Controls:** Long term protectiveness requires prohibition of any activity that may disturb the integrity of the dual barrier cover and other engineered components at the YCL. Protectiveness also requires that groundwater use must also be prohibited until cleanup standards have been achieved in the areas described as landfills in figure 1. EPA has provided a sample easement/covenant to the City of Waukegan and the YCRG members in order to implement land use restrictions to prohibit uses that are inconsistent with the cover and LFG system and groundwater. EPA, the City of Waukegan and YCRG members have been evaluating potential future uses and their compatibility with the dual barrier cover system. YCRG is currently drafting easements/restrictive covenants for all affected properties and will submit them to U.S. EPA in March 2007. U.S. EPA also provided a grant to the City of Waukegan to explore compatible reuses of the site.

**Long Term Stewardship:** Long term protectiveness requires compliance with land use restrictions that prohibit interference with the cover area and restrictions that prohibit groundwater use. Under the O&M Plan, YCRG has agreed to inspect and maintain the integrity of the cover area and submit reports to EPA annually or more frequently, as discussed in more detail in the O&M section below. The groundwater area will also be addressed by the O&M Plan.

### **System Operation/Operation & Maintenance**

Operation of the LFG collection system began during construction and is ongoing. The gas monitoring data for the LFG collection system has shown that the remedy implemented to control the off-site LFG migration has not been able to control LFG migration on the northern portion of the YCL. Several steps have been taken by YCRG and their consultants to improve the LFG collection system; however, the actions so far have resulted in limited success to control off-site gas migration in and around Lovinger Property on the north side of the YCL. Several probes LFG-319, LFG-320, LFG-324, LFG-328 and LFG-329 have been consistently above 50% of the LEL. Additionally, the probes exhibiting LEL greater than 50% have often showed positive pressure readings when negative vacuum readings are expected if vacuum influence of the LFG collection system were effective. This indicates that the LFG collection system vacuum influence is not overcoming the naturally generated pressure build-up caused by the LFG from the YCL.

As discussed above it is evident that the current modified LFG collection system is not capable of controlling LFG migration. Therefore, in order to control the off-site LFG migration, it is necessary to add a secondary permanent active gas collection (extraction and treatment) system. This secondary system under consideration will be independent of the current LFG collection and treatment system and should be capable of controlling off-site LFG migration. The secondary system is expected to be operated continuously and provide an active barrier to LFG migrating beyond the current landfill boundary. The secondary system is expected to consist of a horizontal collection trench extending vertically from historical low water table elevation to close to the surface. Short circuiting to the atmosphere can be addressed in the design. The horizontal extent of the collection trench will run in length from the southeast corner of the Evoy building towards and around Lovinger property to the southern edge of the Terrace Nursing Home property. The design vacuum/flow of the secondary permanent venting system should provide adequate influence to consistently intercept and remove migrating LFG and reduce LFG methane below regulatory levels in the LFG probes to be installed at a later stage. Additionally, the design must take into consideration the shallow water table conditions that exist in these areas and be able to run continuously under all site conditions. The system should meet the substantial requirements for any state, local, or federal air emissions regulatory limits. Provision should be made in the design for extension and expansion of the secondary horizontal vent system if other probes in the vicinity indicate exceedences greater than 50% of LEL.

Furthermore, data collected for the LFG collection system at the YCL has shown that the oxygen leaks were evident into the LFG collection system. The oxygen intrusion into the LFG collection system needs to be addressed.

The temporary LFG collection system installed at the West YCL appears to be effectively controlling the LFG migration, and therefore, it is recommended that this temporary LFG collection system be converted into a permanent system and treatment options for the collected gas should be evaluated and implemented with U.S. EPA approval.

At the time of the ROD, the total present worth of the remedial action was expected to be \$26,300,000 including \$450,000 in annual Operation and Maintenance (“O&M”) costs and \$20,100,000 in construction costs. Given the short period of system operation and that operation & maintenance plans are being developed, a comparison to estimated O&M costs cannot be made at this time. U.S. EPA expects that the next five year review will evaluate such O&M costs.

#### Landfill Gas, Surface Water and Groundwater/Leachate Monitoring Systems

The monitoring system consists of LFG probes, basement monitoring locations, surface water monitoring points, groundwater monitoring wells and piezometers. Installation of the groundwater monitoring wells and LFG probes have been documented including boring logs and construction details. Monitoring is ongoing, however the O&M plan is currently being revised by YCRG and O&M monitoring is expected to begin in spring 2007.

The remedial action systems were inspected and found to comply with the intent of the Remedial Design with the notable exception of the LFG collection system, which is not functioning as intended.

The Settling Work Defendants are represented by YCRG. YCRG has contracted with Hard Hat, Inc., Matrix Environmental and others to perform site operation and maintenance (O&M) activities. Upon approval of the O&M plan, the work will be evaluated to ensure that it is conducted in accordance with O&M requirements. The O&M requirements should incorporate all U.S. EPA and State quality assurance and quality control procedures and protocols.

The long term remedial action requirements at the site for O&M include, but are not limited to, the following activities:

1. Routine operation and maintenance of the cover system, any monitoring systems, fencing and warning signs;
2. Periodic sampling and testing of groundwater monitoring wells, sediment and surface water;
3. Periodic monitoring of LFG probes and basements; and
4. Periodic maintenance of the LFG collection systems and final cover.

Further information is provided in the Data Review section of this report.

## **V. Progress Since the Last Review**

This is the first five-year review for the site.

## **VI. Five-Year Review Process**

### **Administrative Components**

This review was conducted by Matthew J. Ohl, RPM for the site. In support of U.S. EPA's ongoing negotiations with YCRG regarding additional work, U.S. EPA's oversight contractor, Weston Solutions, Inc., conducted a review of existing data and the LFG collection system. The RPM incorporated their review into this report. IEPA also reviewed this report. YCRG was notified of the five-year review by e-mail dated August 16, 2006, and by letter dated on November 15 2006, after being notified verbally earlier.

### **Community Notification and Involvement**

The public was notified of the initiation of the five year review through ads placed in newspapers with local circulation. The ads ran on page 8 of the Friday, October 27, 2006, issue of the News Sun and on page 5 of the Friday, November 10, 2006 issue of the Nueva Semana. The community involvement plan was updated in January 2007. Community involvement activities since that time have been minimal due to a lack of new developments at the site and a relatively low level of public interest. The repository at the public library in Waukegan provides a source of information for interested community members and public meetings have been held in the past to inform and involve the community. Community Involvement Coordinator Mike Joyce regularly attends the Waukegan Community Advisory Group and provides updates of any new developments at the site.

### **Document Review**

This five-year review consisted of a review of relevant documents including legal documents, records and monitoring data. Applicable groundwater cleanup standards were reviewed. With the exception of arsenic, there have been no recent changes in ARARs or TBCs and there are no new standards or TBCs.

### **Data Review**

This review summarizes the analytical results from recently conducted monitoring. Monitoring reports for the September 2006 groundwater sampling event and recent LFG measurements were reviewed.

#### *Verification and Compliance Monitoring Requirements:*

Per the ROD, Consent Decree, memo documenting minor remedy changes, and the O&M Plan, sampling and monitoring will be conducted to verify that performance standards are met. Specifically the following activities are required:

- 1 Monitoring of LFG probes, basements and any discharge of LFG with or without treatment.
- 2 Monitoring of groundwater, sediments, surface water and soils.

#### *Verification and Compliance Monitoring Results To-Date:*

Given that construction activities affecting surface water and shallow groundwater were completed in August 2006 and the O&M monitoring will not be initiated until spring 2007, a detailed analysis of groundwater flow and trends in concentrations is not practicable and any results would be speculative. Instead this review summarizes apparent areas of potential concern based upon the September 2006 groundwater sampling event. The next five-year review or an addendum to this review will focus on the results of the O&M groundwater monitoring.

#### *Summary of Results:*

Explosive levels of LFG appear to be migrating across the northern site boundary, especially near the Terrace Nursing Home and the Lovinger property. This migration appears to fluctuate seasonally and in response to precipitation events.

U.S. EPA notes that the several contaminants in groundwater continue to exceed State and Federal drinking water standards. Such contaminants include arsenic, iron, boron, vinyl chloride, sulfate, and chloride. The concentrations of vinyl chloride in groundwater monitoring wells MW-210, MW-216, and MW-A are a potential concern that will require ongoing monitoring and further evaluation.

#### **Site Inspection**

A site inspection was conducted on Wednesday, January 3, 2007. The weather was partly cloudy, windy and cool with temperatures ranging in the 40's. The mild weather conditions allowed for a full visual inspection of the cover and other site features. Present at the inspection were Matthew J. Ohl, Remedial Project Manager, Erin Rednour of IEPA, and Ray Hladovcak of Hard Hat Services, Inc. Hard Hat Services, Inc. is conducting O&M activities at the site under subcontract to Heritage Industrial Services.

The treatment system is operating and its components are in good condition. Treatment system components are secured by a locked fence in addition to the perimeter fence. The large condensate tank only requires emptying a few times per month. The voltage conditioner has minimized voltage faults. The treatment building appears to be in good condition. Most records are maintained off-site, however, the site health and safety plan and maintenance plans are located in the treatment building.

The following issues were noted during the inspection:

1. Several LFG probes and groundwater monitoring wells, turbine ventilators, and passive vents were unlabeled, unlocked, damaged or otherwise in need of maintenance.
2. There were areas of erosion, ponding, vehicle damage, and animal burrows in the cover.
3. Openings in the perimeter fence were found at creek crossings and the gate to Edward's Field Landfill. Minor fence and warning sign damage was also observed.

YCRG has indicated that the necessary repairs will begin soon.

The site O&M plan requires modification to include the following: mechanisms to ensure regular inspection of ICs at the site, annual certification of IC viability, and a communication plan to ensure that ICs are properly monitored and reported.

### **Interviews**

The need for community interviews was discussed with Mike Joyce, the community involvement coordinator for this site and others in the Waukegan area. The level of public interest and complexity of the remedy were considered in determining whether to conduct interviews. The feedback from recent interviews conducted during the update to the community involvement plan was also considered. Additional community interviews were not determined to be necessary at this time; however, interviews may be conducted in the future if there are significant changes in these factors.

## **VII. Technical Assessment**

### **Question A: Is the remedy functioning as intended by the decision documents?**

No.

The remedial actions at the site have failed to meet cleanup standards. LFG and groundwater monitoring results indicate that properties beyond the boundary of the site continue to be impacted. The LFG and groundwater contaminant levels exceed Federal and State ARARs. Additionally, the required ICs have not been implemented.

### **Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?**

Yes.

Potential Federal ARARs of the ROD consist of the Clean Water Act, the Clean Air Act, National Ambient Air Quality Standard, and Occupational Safety and Health Administration and Department of Transportation standards. Potential State ARARs include the groundwater standards and other appropriate sections of Illinois Administrative Code.



With the exception of arsenic, neither Federal MCLs nor State groundwater standards have changed significantly since the time of the ROD, as amended. Federal and State standards for surface water quality and protection of aquatic life have not changed significantly since the time of the ROD, as amended.

Toxicity and other factors for some contaminants of concern have not changed significantly. Any minor changes in risk assessment methodologies since the time of the ROD do not significantly impact the protectiveness of the remedy.

Based upon a review of site information, it appears that all Federal and State environmental ARAR requirements for on-site activities identified in the ROD are being substantially complied with the exception that LFG continues to migrate beyond the site boundary and cleanup goals have not been achieved.

**Question C: Has any other information come to light that could call into question the protectiveness of the remedy?**

**Yes.**

Since the ROD was issued, landfill gas migration has been further investigated and is now known to be a significant problem in the northern portion of the site. Landfill gas continues to migrate beyond the landfill boundary.

**Technical Assessment Summary**

Based upon a review of existing data, exposure assumptions, cleanup levels, and RAOs, the remedy is not protective due to a failure of the LFG collection system to prevent the migration of LFG. Groundwater does not meet ARARs yet; however, as indicated in the ROD, it is expected to meet ARARs within a reasonable period of time through natural attenuation. Groundwater is not used as a drinking water source in the vicinity of the site so this potential pathway is not currently complete. Institutional controls will be placed on the affected properties to ensure future protectiveness and provide for long term stewardship of the site. Additional ICs may also be explored to account for any newly found contamination.

**VIII. Issues**

The remedy has failed to control the migration of LFG in the northern portion of the site. Institutional controls are needed for properties impacted by the site. Many of the groundwater monitoring wells, LFG probes casings and passive vents and a turbine ventilator need repair and maintenance. The perimeter fence and signs need maintenance and/or repair. Grading and reseeded is needed in several areas of the site cover.

**Table 3: Issues**

Issues	Affects Current Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
1. Gas Collection System Failure	Y	Y
2. Institutional controls are needed for properties impacted by the site and a plan to assure long-term stewardship	N	Y
3. Perimeter fence and signs need maintenance and /or repair	N	Y
4. Grading and reseeding is needed in several areas of the site cover	N	Y
5. Monitoring wells, gas probes, and ventilators need repair and maintenance	N	Y

## IX. Recommendations and Follow-up Actions

**Table 4: Recommendations and Follow-up Actions**

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
					Current	Future
1. Gas Collection System Failure	Further remedial action is necessary including a separate gas collection system.	YCRG	U.S.EPA and IEPA	6-30-07	Y	Y
2a. Dual Barrier Cover, LFG collection system, and areas of groundwater contamination require restrictions	IC Plan including provision for implementation of easements /restrictive covenants for all affected properties (including titlework and mapping) by YCRG.	U.S. EPA	U.S.EPA and IEPA	8-31-07	N	Y
2b. Long-term stewardship	Update O&M Plan to ensure long-term stewardship which includes maintaining and monitoring effective ICs.	YCRG	U.S. EPA and IEPA	12-30-07	N	Y
3. Fence and Signs	Repair the signs and openings in the fence and gate. Remove vegetative growth from fence	YCRG	U.S.EPA and IEPA	6-30-07	N	Y

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
					Current	Future
4. Grading	Correct ponding, erosion, sparse vegetative cover and animal burrow problems	YCRG	U.S.EPA and IEPA	6-30-07	N	Y
5. Wells and LFG	Inspect the groundwater monitoring wells, probes and casings for integrity and repair as necessary. Label casings so they are easily identified from the landfill surface. Secure all wells and probes with locks.	YCRG	U.S.EPA and IEPA	6-30-07	N	Y

## **X. Protectiveness Statement(s)**

The remedy at the YCL is not protective because the LFG collection system is not operating as designed; i.e., LFG above 50% of the LEL continues to migrate beyond the landfill boundary. Additional remedial action as well as implementation and compliance with land and groundwater use restrictions that prohibit interference with the dual barrier cover and the LFG collection system and prohibit use of groundwater are necessary to ensure protectiveness. U.S. EPA and the responsible parties are negotiating the details of the additional remedial action that is expected to include a separate gas collection system for the northern portion of the site.

## **XI. Next Review**

The next five-year review for the Yeoman Creek Landfill is required by February 27, 2012, five years from the date of this review.

## **Attachments**

- Site Maps
- List of Documents Reviewed
- Ads announcing the five-year review

## **Appendix**

No comments were received from the support agency, Illinois EPA or the community.

### **List of Documents Reviewed**

Record of Decision, U.S. EPA, 1996

Partial Consent Decree for Remedial Design/Remedial Action, U.S. EPA, 1999

Preliminary Close-out Report, U.S. EPA, 2005

Groundwater Monitoring Data, YCRG, 2006

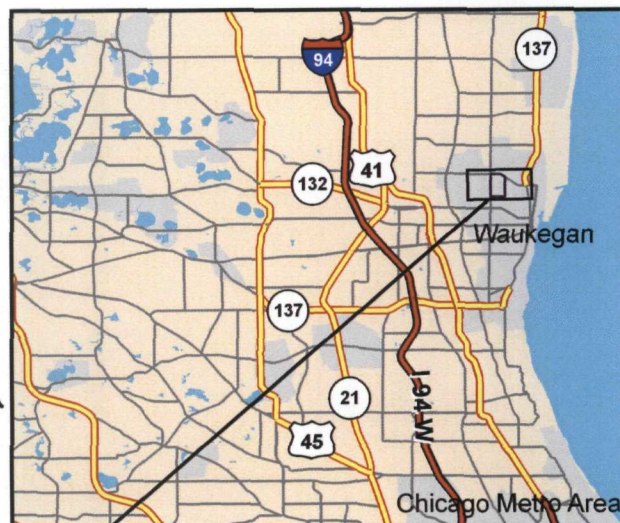
Landfill Gas Monitoring Data, YCRG, 2006-2007

**Yeoman Creek Landfill  
Lake County, IL**

**ILD980500102**



## State



County



## Site

Figure 1

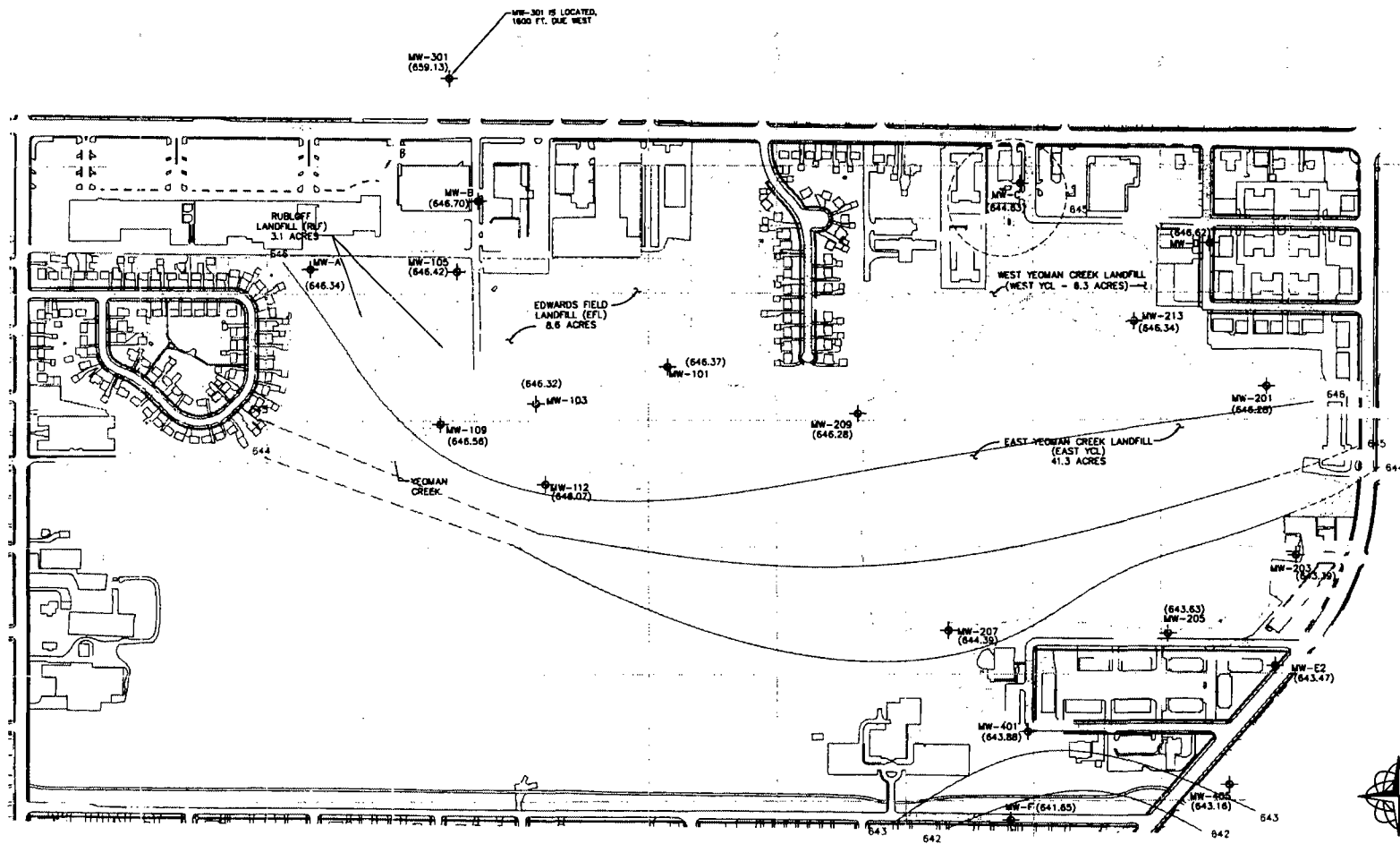
Created by Sarah Backhouse  
U.S. EPA Region 5 on 1/29/07  
Image Date: 2006

### Legend

-  Yeoman Creek Landfill Boundary
  Edwards Field Landfill  
 East Yeoman Creek Landfill
  North Rubloff Landfill  
 West Yeoman Creek Landfill
  South Rubloff Landfill

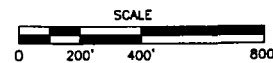





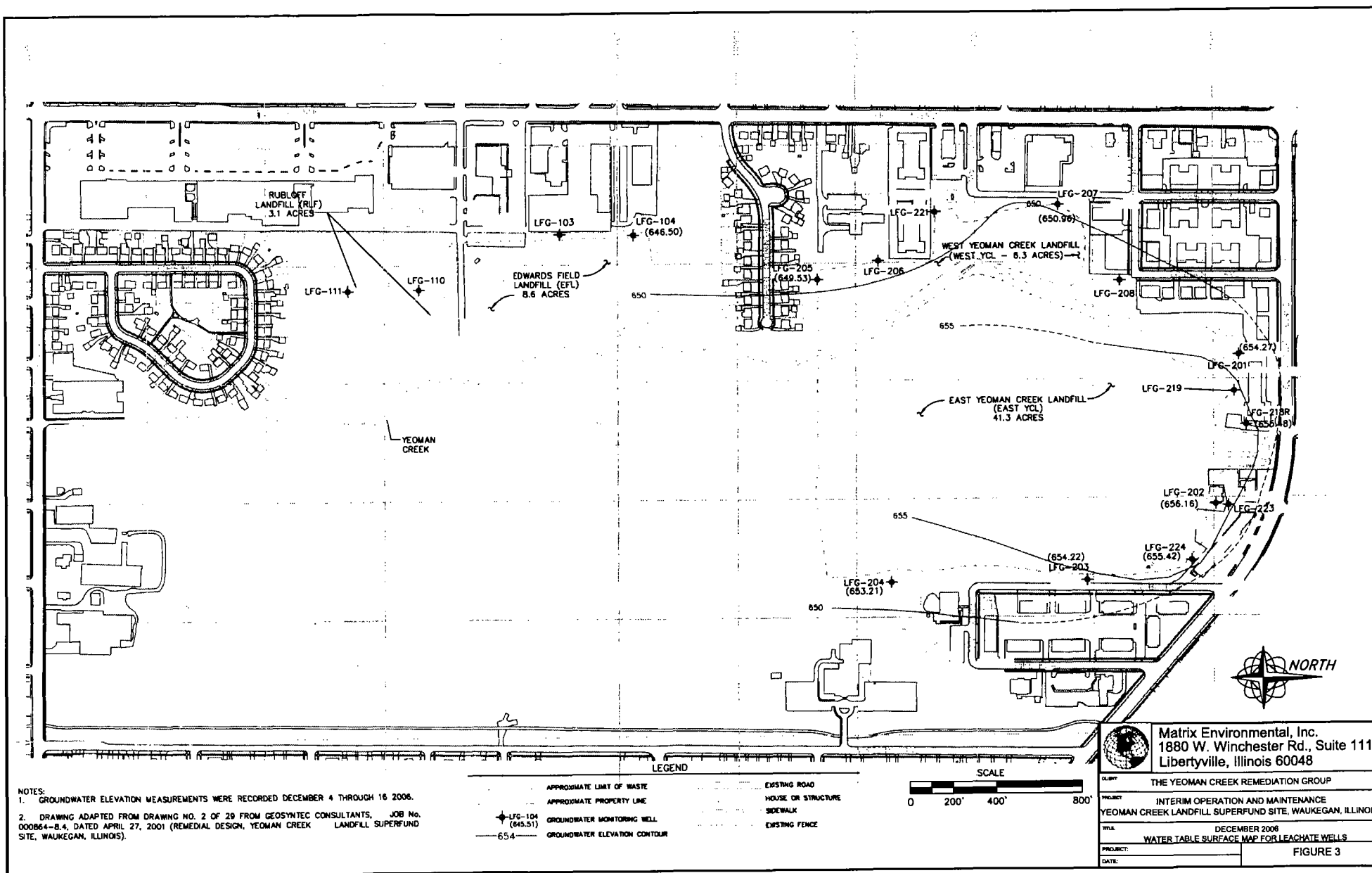


- NOTES:
1. GROUNDWATER ELEVATIONS MEASURED WERE RECORDED DECEMBER 4 THROUGH 16 2006.
  2. DRAWING ADAPTED FROM DRAWING NO. 2 OF 29 FROM GEOSYNTEC CONSULTANTS, JOB No. 000864-B-4, DATED APRIL 27, 2001 (REMEDIATION DESIGN, YEOMAN CREEK LANDFILL SUPERFUND SITE, WAUKEGAN, ILLINOIS).
  3. GROUNDWATER ELEVATION FOR MW-C APPEARS TO BE ANOMALOUSLY LOW IN RELATION TO SURROUNDING DATA, THEREFORE IT WAS DASHED TO APPROXIMATE ELEVATION CONTOURS.

LEGEND			
---	APPROXIMATE LIMIT OF WASTE	---	EXISTING ROAD
---	APPROXIMATE PROPERTY LINE	---	HOUSE OR STRUCTURE
---	GROUNDWATER MONITORING WELL	---	SIDEWALK
---	GROUNDWATER ELEVATION CONTOUR	---	EXISTING FENCE



 <b>Matrix Environmental, Inc.</b> 1880 W. Winchester Rd., Suite 111 Libertyville, Illinois 60048	
CLIENT:	THE YEOMAN CREEK REMEDIATION GROUP
PROJECT:	INTERIM OPERATION AND MAINTENANCE YEOMAN CREEK LANDFILL SUPERFUND SITE, WAUKEGAN, ILLINOIS
TITLE:	DECEMBER 2006 POTENTIOMETRIC SURFACE MAP FOR LOWER OUTWASH WELLS
PROJECT:	
DATE:	FIGURE 2





Friday, November 10, 2006  
Page 5

nto le reducir sus recibos telefónicos por llamadas  
as lla- internacionales hablando siempre que sea  
res en posible a teléfonos fijos.

pañías telefónicas en México harán un cargo de por lo menos 14 centavos por minuto por conexión de llamadas a teléfonos celulares

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Comuníquese con su compañía de larga

Para ésta u otra publicación para el consumidor en formato accesible (texto electrónico ASCII, Braille, letra grande, o audio) escriba o llame a la dirección o teléfono indicados abajo, o envíe un e-mail a: **FCC504@fcc.gov**.

# PROVIDA

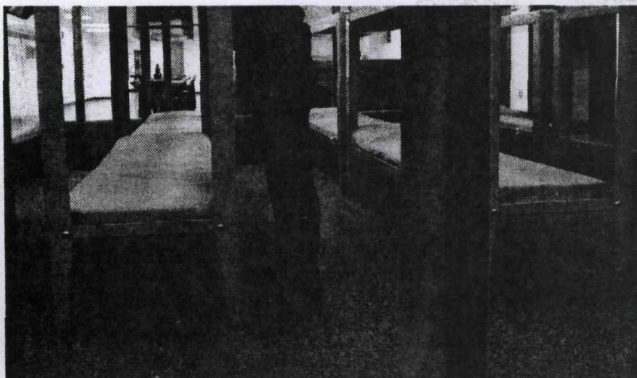
# Medicina Familiar







ht-story addition to e County Jail."



ANDRE J. JACKSON / AJACKSON@SCN1.COM

Sheriff's Deputy Lt. Megan Mercado stands in the new jail's inmate workers dormitory.

opened in phases ded through 2009. cials said that the wer affords space only for more in- but also addition: itation programs ombat recidivism. is provides more icing options for who are not a risk ve a debt to pay to y," said County Chairman Suzi idt, adding that eling and life skills ms "gives them the

ability to live their lives as being unable to pay sub- private citizen a situation not a situation in a situation

## "News Sun" Waukegan, Illinois Friday, October 27, 2006 Page 8

The project as as smoothly as hoped. The original general contractor, UBM of Chicago, defaulted on the project after

## ence in sex case

hael J. Rupp, 37, l guilty to assaulting beginning when the is seven years old. utor Laura Horner e boy's parents had red Rupp a "mentor" t him alone with the

Phillips accepted Rupp's plea to a Class X offense, which carries a mandatory prison sentence of six to 30 years. He denied Rupp's request to delay remand until Monday and ordered him directly to the county jail to await transfer to prison.

## Waiting In Long Lines

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Saturday, November 4th  
609 East Hawley, Mundelein

Sunday, November 5th  
659 W. Railroad Ave, Round Lake

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iosha Visiting Nurse Association & Affiliates  
262-656-8400 myflushot.com

u Shots: \$30 Medicare Part B Accepted

## By Art Peterson

APETERSON@SCN1.COM

Kinze D. Bates pleaded guilty Thursday in Lake County Circuit Court for his role in the ritual gang beating death of his friend, Dontrelle Bell, and was sentenced to eight years in prison.

Rayon L. Edwards, 28, of Waukegan, the ranking gang member who ordered the disciplinary "15-second violation", previously pleaded guilty to second-degree murder and was sentenced to 14 years in prison. Still facing murder charges is Tommie C. Bender, 17, of Waukegan.

Bates, 17, and also of Waukegan, entered a negotiated plea to a reduced charge of involuntary manslaughter.

Bates must serve in adult prison. He can qualify for day-for-day credit for good

behavior, and be released in less than four years. He will receive credit for time held in the county jail, since the incident last Dec. 23.

Bell's arms had been held behind him, and the other two teenagers allegedly beat him in the chest. Bell stopped breathing during the beating and the others took him to Victory Memorial Hospital in Waukegan, where he died later that evening.

Judge John Phillips said the death "was unintentional," but the beating was "reckless, knowing that it likely would cause great bodily harm."

Phillips told Bates: "You're a very young man. You have a chance to turn this around. I hope you don't use the Illinois Department of Corrections to associate with people who will make things worse for you."



## EPA Reviews Yeoman Creek Landfill Superfund Site Waukegan, Illinois

U.S. Environmental Protection Agency Region 5 is reviewing the effectiveness of the cleanup at Yeoman Creek Landfill Superfund site in Waukegan. Superfund law requires five-year reviews of sites where the cleanup is either done or in progress, but hazardous waste remains managed on-site. These five-year reviews are done to ensure that the cleanup remains effective and protects human health and the environment.

The site, including Edwards Field and Rubloff landfills, continues to contain landfill wastes. However, landfill gas appears to be continuing to migrate north of the site and ground-water contamination has not improved yet. Cleanup of the site consisted of:

- Grading the waste surface to the correct slope
- Limiting rainwater contact with the waste
- Installing an active gas collection system at Yeoman Creek Landfill and a wind-assisted ventilator system at the Edwards Field and Rubloff landfills
- Implementing construction controls to limit heavy truck traffic and dust
- Placing a new engineered cover with several layers of material over the landfills

Five-year reviews look at site information; how the cleanup was done; how well the cleanup is working; and any future actions needed.

The review is scheduled to be completed by Feb. 1, 2007, or earlier, and the results will be available for viewing at:

**Waukegan Public Library**  
128 N. County St.

For more information on the review process and to make a comment or provide additional information about the site, please contact:

**Mike Joyce**  
EPA Community Involvement Coordinator  
(312) 353-5546  
(800) 621-8431 (weekdays 9am-4:30pm)  
joyce.mike@epa.gov